METHODS AND SYSTEMS FOR AUTOMATICALLY REGISTERING

COMPLAINTS AGAINST CALLING PARTIES

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By

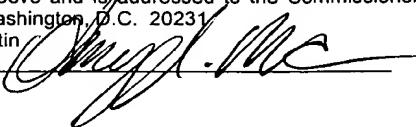Peter Joseph Marsico
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Description

METHODS AND SYSTEMS FOR AUTOMATICALLY REGISTERING COMPLAINTS AGAINST CALLING PARTIES

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Technical Field

The present invention relates to methods and systems for automatically registering complaints against calling parties. More particularly, the present invention relates to methods and systems for automatically generating a

10   complaint registration message in response to receiving a message pertaining to a call from a party with whom communication is not desired.

Background Art

Within the current public switched telephone network (PSTN), signaling

15   is accomplished via the use of signaling system 7 (SS7) messages such as those shown in Figure 1. The simplified SS7 network **100** presented in Figure 1 includes a calling party **102** and a called party **104** that are generally connected via end offices or service switching points (SSPs) **106** and **108** and an SS7 signaling network **110**. As such, SS7 signaling messages may be

20   communicated between the SSP nodes **106** and **108** via signaling network **110**. Those skilled in the art of telecommunication network signaling communications will appreciate that a variety of SS7 messages may be employed to facilitate the setup and teardown of voice calls. Furthermore,

certain types of SS7 messages may be used to access network communication service applications that provide such services as caller ID, 800 number service, etc. A detailed discussion of SS7 signaling message types and their associated function can be found in *Signaling System #7* by

5   Travis Russell, McGraw-Hill Publishing 1998.

As indicated in Figure 1, an SS7 ISDN user part (ISUP) message may be launched by SSP **106** in response to a call attempt by calling party **102**. An SS7 transaction capabilities application part (TCAP) message requesting routing information associated with the call may also be ·generated by SSP

10   **106** during the call setup sequence. It should be noted that in the PSTN network, SS7 signaling messages are not directly sent to or received by the calling or called parties. Instead, such call signaling messages are generated by an SSP or other SS7 signaling points (SP) in response to a call attempt.

However, in an Internet protocol (IP) telephony type communication

15   network such as IP telephony network **150** shown in Figure 2, call signaling messages may be generated directly by a calling or called party's communication terminal. As indicated in Figure 2, the simplified IP telephony network **150** includes a calling party **112** and a called party **114** that are generally connected via a pair of session initiation protocol (SIP) proxy

20   servers **116** and **118**, and an IP network **120**. Again, it will be appreciated that communication network **150** is a greatly simplified example of an IP telephony network architecture, and that numerous other routing and processing nodes may also be employed to provide complete communication network service and functionality. For the purposes of example, it will be

25   appreciated that in such an IP network scenario, SIP signaling messages may

be communicated directly between the calling and called parties **112** and **114**, respectively. That is, the communication terminals (telephone handset, computer, personal digital assistant (PDA), etc.) associated with calling party **112** and called party **114** are adapted to receive, process, and send SIP type

5   signaling messages.

For instance, one example of a SIP type signaling message that could be generated and sent by calling party **112** is a SIP Invite message **200**, presented in Figure 3. SIP Invite message **200** includes a header field **202**, a Via field **204**, a From field **206**, a To field **208**, a Call-ID field **210**, a Content-

10   Type field **212**, a Content-Length field **214**, and a Payload field **216**. Such SIP type messages are employed in a SIP-based IP telephony network to facilitate the setup and execution of a communication session comparable to a telephone call in a conventional PSTN type communication network.

With particular regard to features and services provided by the PSTN, it

15   is well known to block incoming telephone calls based on the calling party's telephone number. Such call blocking service is popular, as it prevents parties associated with certain numbers from being allowed to "ring" a communication service subscriber's phone. Obvious uses for such a service include the prevention of obscene, harassing, and/or annoying phone calls. In

20   particular, such call blocking features are commonly used by telephone subscribers to prevent unsolicited calls from telemarketing organizations.

With regard to telemarketing calls, it will appreciated that this category of calls has become so bothersome that laws have been passed in many states that forbid telemarketing firms from repeatedly calling a telephone

25   subscriber once the subscriber has formally notified the telemarketing firm

that the subscriber does not wish to receive any further solicitations. Although such laws exist and are in place, most subscribers do not know which agency in their government that they should notify in the event of repeated violations of the law by a telemarketing firm. Furthermore, there is no easy, consistent

5   method of documenting violations of the law.

With the advent of IP telephony networks, such as network **150** shown in Figure 2, the control of call or communication session signaling has essentially been moved closer to the calling and called parties. As such, intelligent SIP communication terminals may generate, send, receive, and

10   process signaling messages directly, thereby providing a platform for user-directed processing of signaling messages. Furthermore, IP-enabled communication terminals may be adapted to directly access a wide area communication network such as the Internet or World Wide Web. Consequently, some IP-enabled communication terminals may have

15   simultaneous access to both voice and data network components and services. Thus, a call or communication attempt can assume the form of a voice type call or a non-voice type communication (e.g., e-mail, short text message, short audio message, etc.).

Therefore, what is needed is a system for and method of blocking a call

20   or communication attempt from a calling party, automatically registering a complaint against the calling party, and subsequently notifying the appropriate enforcement authority of violations of applicable laws, utilizing the signaling capabilities of IP-enabled communication terminals.

Disclosure of the Invention

According to one aspect, the present invention includes a communication system for receiving a call attempt from a calling party, identifying the calling party as a calling party with whom communication is not

5   desired, notifying the calling party that no additional call attempts should be made, and automatically registering a complaint with a centralized calling party complaint database. The calling party complaint database may notify an enforcement authority of repeated violations by a calling party and automatically block such repeated call attempts.

10   The present invention includes a communication terminal, such as a telephone, a mobile phone, a personal digital assistant (PDA), or a computer for receiving a call signaling message (e.g., a call setup/teardown message, caller ID message, etc.) and subsequently generating a notification datagram or message for transmission through a data network (e.g., the Internet or

15   WWW). As such, a communication terminal of the present invention is capable of identifying a calling party from signaling information contained within a communication or call setup type signaling message that is received by the terminal. The communication terminal plays a pre-recorded announcement to the calling party notifying the calling party that further calls

20   are not permitted, and subsequently sends a notification message to a calling party complaint registration database. The notification or complaint registration message includes the calling party identification information that was obtained from a communication or call signaling message. Following the initial complaint registration, subsequent complaint registration notifications

25   associated with a repeat offense by a calling party will cause the complaint

registration database to send a violation notification message to an enforcement authority, thereby notifying the enforcement authority of the calling party's repeat offense. With particular regard to the subsequent complaint scenario, the complaint registration system of the present invention

5   is adapted to automatically refuse or block a call or connection attempt by a calling party who is a repeat offender.

The functions for automatically registering complaints against a calling party are described herein as modules or processes. It is understood that these modules or processes may be implemented as computer-executable

10   instructions embodied in a computer-readable medium. Alternatively, the modules or processes described herein may be implemented entirely in hardware. In yet another alternative embodiment, the modules or processes described herein may be implemented as a combination of hardware and software.

15   Accordingly, it is an object of the present invention to provide a communication system for notifying a calling party that no further calls are desired.

It is another object of the present invention to provide a system and method for simultaneously notifying a calling party that no further calls are

20   desired, and sending a complaint registration message associated with the calling party to a complaint registration database.

It is another object of the present invention to provide a system and method for notifying a complaint enforcement authority in response to a called party receiving a call from a calling party after a complaint against the calling

25   party has already been registered at a complaint registration database.

It is another object of the present invention to provide a complaint registration database application for automatically notifying a complaint enforcement authority in response to a called party receiving a call from a calling party after a complaint against the calling party has already been

5   registered at the complaint registration database.

It is another object of the present invention to provide a system and method for automatically blocking call attempts made by a repeat offending calling party.

Some of the objects of the invention having been stated hereinabove,

10   other objects will become evident as the description proceeds, when taken in connection with the accompanying drawings as best described hereinbelow.

Brief Description of the Drawings

Figure 1 is a network diagram illustrating a conventional SS7 call

15   signaling network.

Figure 2 is a network diagram illustrating a conventional Internet protocol (IP) communication network that includes IP-capable communication terminals.

Figure 3 illustrates a conventional session initiation protocol (SIP) Invite

20   message structure.

Figure 4 is a network diagram illustrating complaint and violation message flow pathways through an IP communication network according to an embodiment of the present invention.

Figure 5 is a schematic diagram illustrating an exemplary SIP-based communication terminal architecture including complaint message generation capabilities according to an embodiment of the present invention.

Figure 6 is a diagram that illustrates an exemplary local blocking table structure that may be stored in a communication terminal according to an embodiment of the present invention.

Figure 7 is a diagram that illustrates an exemplary complaint registration message structure according to an embodiment of the present invention.

Figure 8 is a block diagram that illustrates a complaint registration server according to an embodiment of the present invention.

Figure 9 is a diagram that illustrates an exemplary violation message structure according to an embodiment of the present invention.

Figure 10 is a diagram that illustrates an exemplary complaint registration database structure according to an embodiment of the present invention.

Figure 11 is a flow chart illustrating message processing performed by an IP-capable called party communication terminal according to an embodiment of the present invention.

Figure 12 is a flow chart illustrating complaint registration message processing performed by a complaint registration server according to an embodiment of the present invention.

Figure 13 is a network diagram illustrating complaint and violation message flow pathways through a converged SS7 / IP communication network according to an embodiment of the present invention.

Detailed Description of the Invention

Disclosed herein are several embodiments of the present invention that relate to a general technique for enabling a called party to register a complaint

5   against a calling party, and subsequently block call attempts from the calling party. Figure 4 is a network diagram that illustrates the core functionality of one embodiment of the present invention. More particularly, Figure 4 includes a simplified communication network **240** that is comprised of a complaint registration server **242**, an enforcement agency client **244**, an Internet

10   protocol (IP) network **246**, a calling party communication terminal **112**, and a called party communication terminal **250**. Calling party communication terminal **112** is connected to a session initiation protocol (SIP) proxy server node **116**, while called party communication terminal **250** is connected to SIP proxy server node **118**. In the example presented in Figure 4, all of the

15   network elements are adapted to communicate with one another either directly or indirectly via the IP network **246**. For the purposes of illustration, SIP-based messages are used throughout this disclosure. However, it should be appreciated that other equivalent messaging protocols could also be employed to achieve the functionality of the intelligent communication

20   blocking and complaint registration system of the present invention.

Calling party terminal **112** is adapted to generate and transmit a SIP message in response to a call attempt by a calling party. Again, it will be appreciated that calling party terminal **112** may be a wired telephone, a wireless telephone, a computer, or other functionally similar communication

25   device. SIP proxy server **116** is adapted to receive and route SIP messages

to and from calling party **112** via the IP network **246**. In a similar manner, SIP

proxy server **118** facilitates the routing and communication of SIP messages

to and from called party **250** via IP network **246**. Complaint registration server

242 is adapted to process complaint registration messages **300** received via

5   IP network **246** and also to transmit violation messages **360** via IP network

246.   Enforcement agency client **244** is adapted to process violation

messages **360** received via IP network **246**.

With particular regard to the called party communication terminal **250**,

a more detailed diagram of one embodiment of the terminal is provided in

10   Figure 5.   Referring to Figure 5, SIP-enabled communication terminal **250**

includes a current call information buffer **252**, a complaint registration

application **254**, a recorded message buffer **256**, and a complaint message

generator **258**. Current call information buffer **252** is adapted to examine an

incoming SIP message, such as SIP Invite message **270**. Buffer **252** extracts

15   and temporarily stores relevant information associated with incoming call or

communication request. In the one case, relevant information may include

information related to the identity of the calling party, such as the "From" field

206 or the "Call-ID" field **210** shown in the SIP message structure presented

in Figure 3. Buffer **252** is also adapted to communicate some or all of such

20   relevant information to the local complaint registration application **254**, where

this information may be retained and stored.

The local complaint registration application **254** is a software or

firmware process that runs within the communication terminal .**250** which is

adapted to perform a number of operations related to the call blocking and

25   complaint registration functionality of the present invention. More particularly,

complaint registration application **254** is adapted to receive a manual trigger **272** initiated by a called party in response to the receipt of an unwanted call or communication. In one embodiment, the manual trigger could be generated by the pressing of a pre-programmed button on the communication terminal.

5 In the event of a personal computer based communication terminal, the manual trigger could be generated by the clicking of screen icon by a mouse or other such pointing device. Complaint registration application **254** is also adapted to perform certain functions without the need for an explicit manual trigger. More particularly, if a call or communication setup message is

10 received from a calling party who has been previously notified by called party communication terminal **250** that no further calls or communications are desired, then complaint registration application **254** is adapted to automatically refuse the call or communication attempt. Such automatic call blocking functionality is accomplished in one embodiment through the use of a

15 blocking table or database that is maintained and accessed by the complaint registration application **254**. As illustrated in Figure 6, such a blocking table **260** may include a calling party identifier **262** and flag **264** that indicates whether the calling party has previously had a complaint registration message launched from the terminal. As such, calling party information associated with

20 an incoming signaling message can be compared with the contents of the "local" blocking table **260** to determine whether blocking is required.

Referring back to Figure 5, recorded message buffer **256** is a software or firmware process that is adapted to play a pre-recorded announcement **282** to the calling party associated with SIP Invite message **270** notifying the

25 calling party that a complaint has been registered and that no further

communication attempts should be made. The pre-recorded announcement may be an audio message or a text message depending upon the context of the attempted communication. For example, if a voice type communication attempt was being attempted by an offending calling party, an audio message

5   could be played. If the offending calling party was attempting to send a text type short message or e-mail, a text announcement or notification message could be sent to the calling party in response. Such notification announcements could be played or sent each time a manual trigger is initiated. In the case of repeat offenders, an alternate pre-recorded

10   announcement could be automatically played (i.e., without requiring a manual trigger) which informs the offending calling party that a violation message has been sent to an enforcement agency.

Complaint message generator **258** is adapted to create and transmit a complaint registration (CR) message **300** in response to an appropriate

15   instruction from the complaint registration application **254**. In the example implementation described herein, it is assumed that the CR message utilizes SIP protocol. However, a SIP-formatted CR message is not essential to the operation of the present invention, and any number of different application protocols could be employed to carry the CR "payload."

20   Shown in Figure 7 is a sample CR message structure and associated sample content. Sample CR message **300** includes a message header component **302**, which, for the purposes of a SIP example, can include any required SIP header / packet information. CR message **300** also includes a subscriber ID field **304**, a password field **306**, an encryption field **308**, and a

25   CR payload field. CR payload field further includes a "From" field **310**, a "To"

field **312**, and a "Call-ID" field **314**. Again, it will be appreciated that the information contained in the CR payload field is relevant to determining and/or verifying the identity of the offending calling party. Other, functionally equivalent CR message structures could easily be employed using a variety of application protocols to satisfy the desired objective of complaint registration without departing from the scope of the invention.

With regard to the complaint registration server **242** shown in Figure 8, it will be appreciated that this server and associated applications are adapted to receive, process, and store complaint registration (CR) messages. One component of CR message processing includes generating a violation message in response to determining that a received CR message represents a repeat offense by a calling party. Complaint registration server **242** achieves this functionality by receiving, storing and analyzing CR messages received from a subscriber. In one embodiment, complaint registration server **242** is adapted to receive and processes CR messages from a plurality of subscribers, thereby acting as a centralized, controlled repository of calling party complaint information.

In the embodiment illustrated in Figure 8, complaint registration server **242** is comprised of a complaint database manager process **380**, a complaint database **382**, and a violation message generator **384**. Complaint database manager process **380** is adapted to receive a CR message **300**, extract information related to an offending call and subsequently perform a search or lookup operation in the associated complaint database **382** using this information. Complaint database manager process **380** is further adapted to

initiate the generation of a violation message **360** via violation message generator **384** in the event that a repeat offense is indicated.

Figure 9 illustrates a sample violation message structure and associated sample content. Sample violation message **360** includes a
5 message header component **500**, which for the purposes of a SIP example, could include any required SIP header / packet information. Violation message **360** also includes an encryption field **502**, and a violation payload field **504**. Violation payload field **504** further includes an "Offending" field **506**, a "Complaining" field **508**, a "Call-ID" field **510**, and a "Complaint Count" field
10 **512**. Again, it will be appreciated that the information contained in the violation payload field is relevant to determining and/or verifying the offending call, as well as the identity of the offending calling party. Other functionally equivalent violation message structures could easily be employed using a variety of application protocols to satisfy the desired objective of reporting a
15 calling party harassment law violation without departing from the scope of the invention.

Figure 10 illustrates one embodiment of complaint database **382**. In this simplified example, database **382** is comprised of a several tables including a complaint table **400** and an enforcement table **420**. Complaint
20 table **400** employs a multi-field key structure that is comprised of an Offending Party ID field **402**, a Complaining Party ID field **404**, and a Call-ID field **406**. Associated with each unique key is a Complaint Count field **408**, and an Enforcement Agency (EA) ID pointer **410**. Enforcement table **420** is keyed by a corresponding EA ID pointer **422**, and associated with each unique EA key
25 is an enforcement agency contact field **424**. In one embodiment, the

enforcement agency contact value is an e-mail address associated with a state attorney general's office.

Complaint Registration System Operation

5   Returning to Figure 4, it will be appreciated that operation of the embodiment shown involves the creation and transmission of a call or communication setup message **270** by the calling party **112**. For the purposes of example, it is assumed that the setup message **270** is a SIP Invite message. With particular regard to SIP based communication, it will be

10   appreciated that a number of SIP signaling messages are actually employed in the establishment of a call or communication; however, for the purposes of illustration, only a SIP Invite message is considered herein. A more detailed treatment of SIP and the associated session description protocol (SDP) can be found in Internet Engineering Task Force (IETF) RFC 2543, *SIP: Session*

15   *Initiation Protocol*, March 1999 and IETF RFC 2327, *SDP: Session Description Protocol*, April 1998, the disclosures of which are incorporated herein by reference in their entirety.

        While receipt of the initial call setup signaling message by a called party terminal is significant in one embodiment of the present invention, the

20   origin and routing history of the message may not be particularly relevant. Again, from Figures 4, 5 and 6 it will be appreciated that calling party **112** initiates a SIP Invite message **270** that is ultimately received by the called party terminal **250**. Processing of the received SIP Invite message by called party terminal **250** depends on the call history associated with the calling party

25   **112**, as generally indicated in flow chart presented in Figure 11.

Referring to Figure 11, once the SIP Invite message is received by the called party terminal (**ST1**), the current call information buffer **252** examines the message and extracts relevant information associated with the call, including information that completely or partially identifies the calling party (**ST2**). This information is compared against calling party entries stored in the "local" blocking table **260** that is maintained by the complaint registration application **254** (**ST3**). If a match is found in the "local" blocking table, which indicates that the calling party has previously committed an offending call, then setup of the call or communication is terminated (**ST4**) and the complaint message generator **258** is directed to create and launch a complaint registration message **300** (**ST5**). If a match is not found in the blocking table **260**, then call or communication session setup is allowed to proceed to completion (**ST6**). If, while the call or communication is in progress, the called party user determines that the call is harassing or annoying, the called party user may elect to manually trigger a complaint registration (**ST7**). Again, such a manual trigger might be the pressing of a pre-programmed button on the communication terminal or the clicking of a pointing device associated with a computer. In any event, once the manual trigger has been initiated, the complaint message generator **258** is directed to create and launch a complaint registration message **300** (**ST8**). The recorded announcement buffer process **256** is also directed by complaint registration application **254** to play a pre-recorded announcement **282** to the offending calling party, thereby notifying the calling party that a complaint has been registered and that no further communication attempts should be made (**ST9**). The pre-recorded announcement may be an audio message or a text message depending upon

the context of the attempted communication. For example, if a voice type communication attempt was being attempted by an offending calling party, an audio message could be played. If the offending calling party was attempting to send a text type short message or e-mail, a text announcement or

5   notification message could be sent to the calling party in response. An example of such an announcement or text message may be, "You have been previously notified not to attempt communication with this party. A complaint has been registered against you." Once the pre-recorded announcement has been played or delivered to the offending calling party **112**, the call or

10 communication session is automatically terminated (**ST10**).

As indicated in Figure 4, the complaint registration (CR) message **300** formulated by the called party terminal **250** is transmitted via IP network **246** to complaint registration server **242**. Figure 12 illustrates the basic steps associated with processing of CR message **300** by the complaint registration

15 server **242**. Referring to Figure 12, once the CR message **300** is received by the complaint registration server **242** (**ST1**), the complaint database manager process **380** examines the message and extracts relevant information associated with the offending call, including information that completely or partially identifies the calling party (**ST2**). Such information may include a

20 calling party identifier, a called party identifier, and an identifier associated with offending call or communication. This information is compared against existing complaint entries stored in the complaint database **382** (**ST3**). If a match is found in the complaint database, indicating that a complaint has been previously registered against the calling party by the called party, then

25 the violation message generator **384** is directed to create and launch a

violation message **360** (**ST4**). The violation message is transmitted via IP network **246** to the appropriate enforcement agency (**ST5**), as determined during the complaint database lookup. The enforcement agency may use this violation message to document repeated legal infringements by a calling

5   party, and take legal action as required. If a match is not found in the complaint database **382**, then a new complaint database entry is created, based on information contained in the complaint registration message **300** (**ST6**).

10   <u>Hybrid Complaint Registration System Embodiment</u>

Figure 13 illustrates a hybrid complaint registration system embodiment which is adapted to provide essentially same the complaint registration system functionality described above to conventional PSTN telephone service subscribers. More particularly, Figure 13 is comprised of a hybrid or

15   converged communication network **600** that includes a PSTN / SS7 signaling component **610** and an Internet protocol (IP) network component **632**. Network **600** also includes a calling party terminal **602** and a called party terminal **604** which are connected to a pair of SS7 service switching points (SSPs) **606** and **608**, respectively. SSP **606** and SSP **608** are adapted to

20   communicate SS7 signaling messages via SS7 network **610**. Signaling gateway (SG) **620** is adapted to receive an SS7 ISUP or TCAP signaling message from an SS7 signaling point (SP) within or connected to SS7 network **610** and to translate or convert the SS7 signaling message into a protocol format that is compatible with IP network **632** and nodes residing

25   therein.

Of particular interest in this example is a complaint registration server node **630** that resides within or is connected to the IP network **632**. Again, in this example, complaint registration server node **630** is adapted to send, receive and generally process messages that are formatted in a transport adapter layer interface (TALI) based protocol. Preferred packet formats for encapsulating various types of SS7 messages in IP packets are described in Internet Engineering Task Force (IETF) Internet Draft <draft-benedyk-sigtran-tali-01.txt>, June 2000, the disclosure of which is incorporated herein by reference in its entirety. Furthermore, an implementation of the transport adapter layer interface is described in commonly-assigned, co-pending U.S. Patent Application No. 09/588,852, the disclosure of which is incorporated herein by reference in its entirety. It will be appreciated that the concepts described in this disclosure are not dependent on the above referenced transport adapter layer interface signaling protocol. Other functionally similar signaling protocols may be employed within the scope of the present invention, including for example, the IETF SUA/M3UA protocol. The SS7 SCCP User Adaptation Layer is described in IETF internet draft <draft-sigtran-sua-03.txt, November, 2000, the disclosure of which is incorporated herein by reference in its entirety. The SS7 MTP3 User Adaptation Layer is described in IETF Internet Draft <draft-ietf-sigtran-m3ua-04.txt>, March 2000, the disclosure of which is incorporated herein by reference in its entirety.

Another protocol that may be utilized to communicated complaint registration and violation messages between network entities is the SCTP protocol, as described in RFC 2960, Stream Control Transmission Protocol,

October 2000, the disclosure of which is incorporated herein by reference in its entirety.

In any event, it will be appreciated that in this embodiment of the present invention, signaling messages are not received or transmitted directly by the calling or called party telephones **602** and **604**, respectively. Consequently, complaint registration message generation cannot be accomplished at the called party terminal **604**. Instead, called party terminal **604** is adapted to notify or trigger SSP **608** to generate a complaint registration message on its behalf. It is known to provide similar SSP triggers by using touch tone key strokes, such as "*69." In this case, a called party user would be required to dial "*99," for instance, when a determination has been made that a particular call is harassing or annoying. Receipt of the "*99" trigger would induce SSP **608** to generate a transaction capabilities application part (TCAP) based complaint registration (CR) message, and transmit this message to SG **620**. SG **620** upon receipt of the TCAP based CR message is adapted to translate the TCAP CR message into an equivalent TALI formatted CR message. Once this translation is accomplished, the resulting TALI CR message can be delivered to the IP network based complaint registration database **630**. Processing of the TALI CR message at the complaint registration database **630** is identical to the CR message processing described above. In fact, a single complaint registration database could be implemented that would be adapted to service SIP, TALI, and any number of other CR message formats.

With regard to TALI and SG operation, a detailed description of a SG product which is marketed by the assignee of the present application as the

IP^7 Secure Gateway$^{™}$, may be found in Tekelec publication PN/909-0767-01, Rev B, August 1999, titled *Feature Notice IP^7 Secure Gateway$^{™}$ Release 1.0*, the disclosure of which is hereby incorporated by reference. The specific functional components of an IP^7 Secure Gateway$^{™}$ for transmitting and

5   receiving transaction capabilities application part (TCAP) messages over an Internet Protocol (IP) network are described in commonly-assigned, co-pending international patent publication number WO 00/35155, the disclosure of which is incorporated herein by reference in its entirety.

Returning to SSP **608**, it will be appreciated that control logic within the

10   SSP is adapted to maintain information that identifies the calling party **602** while a call is in progress. In response to a touch tone or similar type trigger initiated by a the called party **604**, SSP **608** is further adapted to generate a complaint registration message using the same basic approach as described above and generally illustrated in Figure 5. If SSP memory storage were

15   available, a blocking table, similar to that described previously and illustrated in Figure 6, could also be maintained for each telephone customer. In essence, the hybrid network embodiment described above simply moves the control and responsibility for complaint registration message generation into the core of the SS7 signaling network. Instead of the control and

20   responsibility for complaint registration message generation residing in the end user communication terminals, as described initially, the hybrid embodiment requires the SSP that services a called party to generate a complaint registration message. However, in both embodiments, the end user controls when an initial complaint is registered.

25

Obscene Call Identification and Complaint Registration

Although the examples listed above are primarily directed to automatically generating complaint registration messages for callers that have been previously notified that communication is not desired, such as

5 telemarketers, the present invention is not limited to such an embodiment. In an alternative embodiment, the present invention may include identifying obscene calls and generating complaint registration messages against obscene callers. For example, if a party receives a communication from an obscene caller, the party can push a button on the party's telephone to trigger

10 a voice message tailored to obscene callers to be played, trigger a complaint registration message that identifies the call an obscene call, and terminate the call. Referring back to Figure 4, complaint registration server **242** may distinguish between a complaint on a repeat caller such as a telemarketer versus a complaint for an obscene caller. Such distinction may be made by

15 adding a field to complaint registration message **300** illustrated in Figure 7 for identifying the call as an obscene call or a repeat violation call. Such a field may be included in the payload area of the complaint registration message.

In response to receiving a complaint registration message pertaining to an obscene call, complaint registration server **242** may immediately send a

20 violation message to an enforcement authority without waiting for a repeat. Thus, the present invention can be used to identify and generate complaint registration messages and violation messages for obscene calls.

Although the embodiments listed above are primarily directed to SIP-initiated and SIP-terminated calls, the present invention is not limited to such

25 embodiments. For example, the methods and systems for complaint

message generation described above are applicable to PSTN-originated to SIP-terminated calls and vice versa.

In addition, the present invention is not limited to generating complaint registration messages for telephone calls. For example, a communication

5 recipient may receive repeat communications, such as facsimile communications, email communications, short message service communications, etc., from parties who have been previously notified that communication is not desired. In response to receiving messages relating to these communications, the terminal equipment associated with the

10 communication recipient may automatically generate complaint registration messages using the procedures described above. Thus, the present invention prevents harassment by facsimile, email, or other media, in addition to telephone calls.

It will be appreciated that various details of the invention may be

15 changed without departing from the scope of the invention. Furthermore, the foregoing description is for the purpose of illustration only, and not for the purpose of limitation—the invention being defined by the claims.